

# ROUNDUP

NASA LYNDON B. JOHNSON SPACE CENTER

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SETTING AN EXAMPLE — Dr. Bradley Prior, project manager for the JSC Clinic, receives his swine flu immunization from Evelyn West, chief nurse. The shots will be available to all badged NASA and on or off-site contractor employees, beginning Nov. 8. The immunizations will be given at various locations around the center according to a schedule released this week.

## Clinic offers swine flu shots to JSC, contractor employees

Swine flu vaccinations will be available to all badged NASA and on or off-site contractor employees beginning Nov. 8, Dr. Lawrence F. Dietlein, acting director of Life Sciences, has announced.

Shots will be given by JSC Clinic staff at various building locations according to an announcement issued this week.

To receive the immunization, employees must go to the vaccination site at the assigned times and fill out a consent form. They are asked to wear clothing that allows access to the upper arm. A physi-

cian will be present to answer questions.

The following restrictions should be noted:

Persons with hypersensitivity to eggs or chickens should receive the vaccine only under close supervision of their private physician.

Pregnant women should receive the vaccine from their private physician.

Persons with illnesses involving high fever should not be vaccinated until they recover.

Persons currently under medical treatment should have a signed

statement from their physician that there are no objections to the immunization.

Employees will be receiving Monovalent (Swine Influenza) vaccine. Bivalent (A Victoria and Swine Influenza) vaccine will be given to persons 65 years and older and persons with heart, pulmonary and other chronic diseases. See the announcement for time and place to receive Bivalent.

Persons unable to meet the time schedule may get their shots at the JSC Clinic after Nov. 18.

## Contract managers schedule symposium

Rear Adm. Stuart J. Evans (USN-Ret), NASA assistant administrator for procurement, will be among several government and industry speakers at a symposium, Nov. 11, sponsored by the Space City-Houston Chapter, National Contract Managers Association.

The program begins at 8 a.m. at the Nassau Bay Motor Inn, 1600 NASA Road 1. Theme of the symposium is "Contracting Out for Goods and Services for Government Use."

Other speakers include: John E. O'Brien, NASA assistant general counsel for procurement matters; Donald K. Slayton, Approach and Landing Test manager; Douglas E. Corderman of Emerson Electric

Co., national president of NCMA, and James F. Fitzpatrick, partner, Arnold and Porter.

Also, William D. Russell of the Office of Federal Procurement Policy, Office of Management and Budgets; Stephen Kozak, research director, American Federation of Government Employees; John H. Kunsemiller, director of contract administration and support, Office of the Assistant Secretary of Defense, and Raymond Romatowski, ERDA assistant administrator for administration.

Registration for the symposium, including lunch and dinner, costs \$45 for members, \$55 for non-members. For information, contact Dave Gott, 333-2419.

## Observers wanted to record eclipses

Houston-area astronomers will join forces Thanksgiving night to observe and record data on a rare series of eclipses.

On Nov. 25, a bright double-star system will be eclipsed for up to six minutes by rugged mountains on the edge of a crescent moon.

Organizers hope to involve 100 observers near La Marque to record high resolution information on this unique phenomenon.

The eclipses will be visible only along a three-mile wide stretch from northern Mexico through

South Texas, near La Marque and out into the Gulf.

By accurately timing the moments of disappearance and reappearance of the stars, astronomers can determine relative heights of features on the lunar surface never before charted.

In addition, they hope to gain information on an invisible third component of the star system.

Persons interested in assisting may contact Paul Maley, X-6457, or Dick Rogan, X-5482.

## National Secretaries chapter picks Gilbreath Boss of Year

Kenneth Gilbreath, deputy director of Center Operations, was selected as Boss of the Year for the NASA Clear Lake Chapter of the National Secretaries Association (International).

This announcement was made at the Executive Night Dinner held recently at the Old Swiss House in observance of National Bosses Day. Gilbreath was selected by a panel of impartial judges composed of Gordon Kovich, Alpha Building Corp.; Albert C. Richmond, Photo-Sonics, and Leonard L. Riskin, University of Houston College of Law.

The competitive selection was based on a point system and the judges were unaware of the name and identification of the nominees. Candidates for Boss of the Year were nominated by NSA chapter members and information pre-

sented to the judges included education; participation in civic, church, and professional activities; achievements and awards received, and business experience. The secretary also stated personal reasons why she felt her particular supervisor merited the title.

Carol Jean Smith, secretary to Gilbreath, said: "Mr. Gilbreath is truly worthy of the title 'Boss of the Year.' He is genuinely respected and liked by all who know and work with him. He is a very warm and understanding person, and his consideration for people is remarkable.

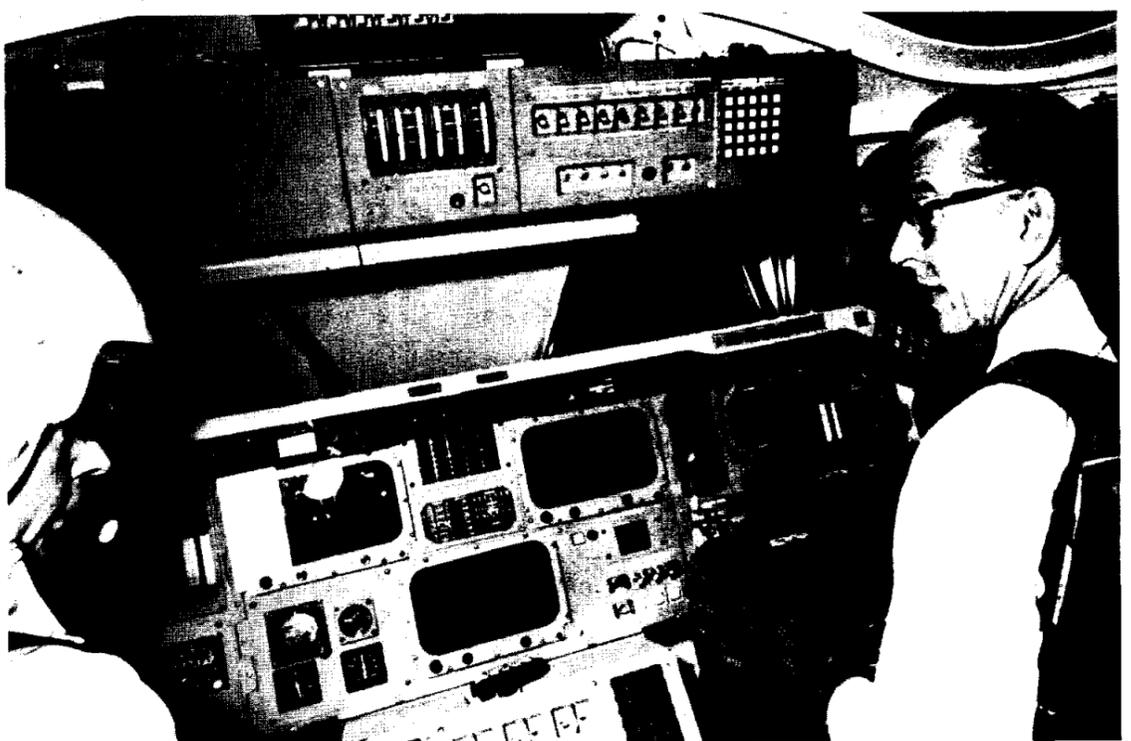
"He recognizes today's secretary as being a vital part of a successful organization. He heartily approves of NSA's educational programs and of our continuing emphasis on higher learning and greater effi-

ciency and the human behavioral aspects of the secretarial profession.

"Mr. Gilbreath excels in his profession (and challenges me to excel in mine), contributes extracurricular time to the betterment of his fellow man, and enjoys his avocations. The true worth of an honor is to deserve it rather than to possess it — and he truly deserves it."



Kenneth Gilbreath



ADMINISTRATOR "PILOTS" ORBITER — NASA Administrator Dr. James C. Fletcher, right, is checked out on the Orbiter Aeroflight Simulator by Astronaut Office Chief Capt.

John Young. Fletcher "flew" the unique simulator, which has six degrees of freedom, during a visit to the center Oct. 21. The simulator is located in Bldg. 5.

# Indian organization honors JSC engineer Jerry Elliott

Jerry Elliott, of the Space Shuttle GFE Project Office, has received a 1976 National American Indian Achievement Award from the American Indian Art and Cultural Exchange.

Elliott, an Osage, was honored for outstanding achievement in the field of science and engineering.

The JSC engineer received his award Oct. 13 at the CBS studios in Los Angeles.

"To achieve is not enough," the certificate states. "These awards are presented only to those who use their achievements to help others."

Elliott is chief of the New Trails Club, JSC's native American organization. He co-authored the proclamation recently passed by Congress and signed by President Ford which declared Oct. 10-16 as Native American Awareness Week.

It was the first time in the nation's history that there has been a national observance honoring American Indians.

The American Indian Art and Cultural Exchange says it "is a non-profit educational organization founded by people of American Indian heritage and created to instill in every American an appreciation of the Indian arts and to develop pride in the cultural heritage and achievements of American Indians."

Other groups participating in the awards presentation were the Indian Actors Workshop, the American Indian Scholarship Fund and the United Indian Development Association.



INDIAN EXHIBIT — Center Director Dr. Christopher C. Kraft Jr. looks over displays recently set up in the lobby of Bldg. 1 in observance of Native American Awareness Week. The exhibit case holds Indian pottery and other artifacts. On the easel at top left is the proclamation signed by President Gerald Ford declaring Native American Awareness Week. JSC Engineer Jerry Elliott brought the document back from Lawton, Okla., where it was signed by the President.

## Andrew Goris chosen top November Co-op

Andrew C. Goris, Texas A&M University electrical engineering major, has been named JSC Cooperative Education Student of the Month for November.

Goris, assigned to the Avionics Systems Engineering Division, was nominated by Dr. G. D. Arndt, chief of the Applied Analysis Section.

Arndt's recommendation was

based on Goris's "outstanding job" while working on the Electrical Power System Simulation, a Shuttle data management program and a computer program which simulated radio frequency blockage of Shuttle's communication antennas.

"This quantity and quality of work output would be significant even for a fulltime NASA engineer," Arndt said.



Pat Patnesky

Pat Patnesky, daughter of JSC photographer and Mrs. A. R. Patnesky, was crowned Miss Transportation International for 1976-77 at competition in Mexico City.

She was chosen from five finalists representing Traffic Clubs International from the United States, Mexico and Canada.

Patnesky, a flight attendant for Continental Airlines, is a former Miss Bluebonnet Bowl. She was chosen Miss Transportation of Houston during National Transportation Week.

## Center chooses Alpha to negotiate contract

Alpha Building Corp. of Houston has been selected for negotiations leading to the award of a cost-plus-award-fee contract for construction support services at the center.

The services include minor construction and alteration of laboratory systems, facilities, utilities, roads, sewers, walks and other site work as required by space program requirements and shall normally be for projects estimated at \$10,000 or less.

Proposed cost and fee for providing these services for the period beginning Dec. 1, 1976, and ending Nov. 30, 1977, is approximately \$1,369,000.

At the end of the first contract year, the government has the option to extend the contract for two additional 1-year periods.

## Applicants now total 400

The Astronaut Candidate Program Office reported, Oct. 28, that 400 applications have been received for civilian astronaut pilot and mission specialist candidate positions. Of a total 8,238 applications and

announcements mailed out by request, 179 went to JSC employees.

Civilian applications must be postmarked no later than June 30, 1977. For information, write the Astronaut Candidate Office, AHX.



ZERO G TESTING — Marshall Space Flight Center scientist Otha Vaughn Jr. monitors performance of experimental cloud physics hardware during recent weightlessness tests aboard JSC's KC 135 Zero Gravity Test Aircraft. The cloud physics hardware may be flown aboard Shuttle/Spacelab as part of the Atmospheric Cloud Physics Laboratory.

## BOOK REVIEW

### Page text reads easy

By Lyn Cywanowicz

*Space Science and Astronomy: Escape from Earth*, Page and Page, 467 pp. New York: Macmillan Publishing. \$13.95.

Edited by JSC Astrophysicist Dr. Thornton Page and Lou W. Page, his wife, this newest volume in the Macmillan Sky and Telescope Library Series is an informative and easily-read text incorporating articles written by a number of prominent scientists and astronomers.

Using charts, diagrams, photographs and layman's terminology, the editors explain achievements in space exploration. The book also

discusses what experts have learned from data gathered by manned and unmanned space flights.

The Pages provide space technology enthusiasts with scientific information that is easily understood.

## Secretaries schedule seminar at university

The NASA-Clear Lake chapter, National Secretaries Association (International) will hold its seventh

annual seminar in conjunction with the University of Houston at Clear Lake City beginning Nov. 11.

The seminar, dealing with transactional analysis, is intended for both secretaries and management. It will include a full-day program at UHCLC, Nov. 11, and a second program to be scheduled in January.

Dr. Warren Chaney, UHCLC professor of business and industry, will be guest speaker.

Space is limited and preregistration is advised. Cost is \$20. For information, call Carol Jean Smith, X-3116.

## ROUNDUP

NASA LYNDON B. JOHNSON SPACE CENTER

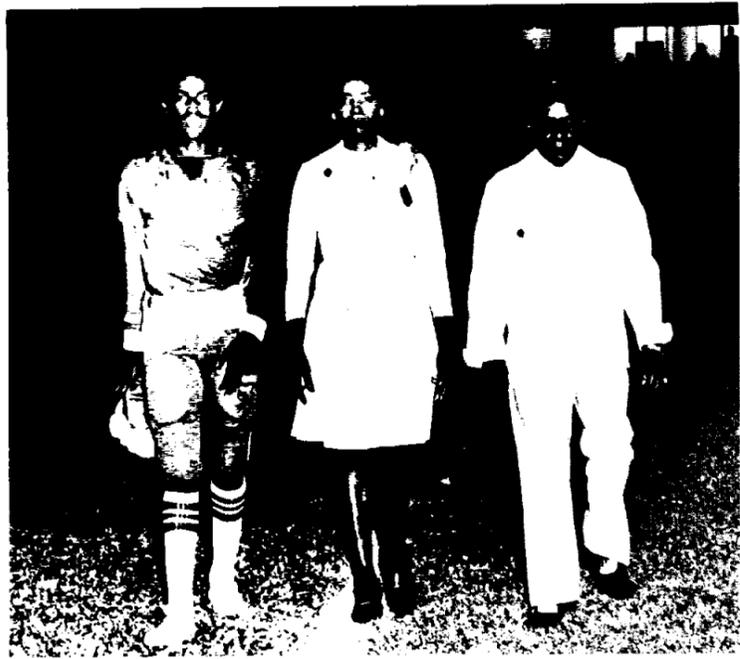
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Editor: Richard Finegan

Photographer: A. "Pat" Patnesky



SATELLITE LAUNCHERS — This artist's concept shows two Delta Class and one Atlas/Centaur Class Spinning Solid Upper Stages (SSUS's) in launch configuration with satellites attached in the cargo bay of a Space Shuttle Orbiter. The SSUS will be a more economical vehicle for delivering satellites from the Orbiter's low Earth orbit to their required transfer orbits, such as missions to geosynchronous positions.



**PROUD PARENTS** — Margaret Little, a Rockwell International employee at the Space Shuttle Program's Management Information Center, stands with her husband, Seth, and son, Donnie, as they are honored at Dickinson High School Parents Night ceremonies, Oct. 22. Donnie, 17 and a junior is quarterback of the Dickinson Gators and led the team to a 7-0 District 24AAA record that night with a 55-8 win over Santa Fe.

# Edmiston leads JSC joggers

Claud Edmiston ran two miles in 10 minutes, 34 seconds, to clock in JSC's fastest time in the second NASA Intercenter Postal Jogging Competition held Oct. 21.

Edmiston, 46, of the Control System Development Division, sped around the Clear Lake High School track faster than 47 other JSC and contractor employees.

The participants competed according to sex and age group. JSC results were mailed to Ames where they will be compared to other centers to determine agency-wide winners.

Edmiston's time, and the second place finish of 10:36 by Jim Gilbert, give JSC a good chance of standing high in the overalls, said Recreational Director Tim Kincaid.

Among women runners, Sue Dragich crossed the finish line in 13:16, faster than the overall women's winner in the first competition held last June, Kincaid said.

Categories, top winners and their times were:

Men, 29 and under: Neil Griffith, 11:44; Clay Jones, 12:27; John Rector, 13:24; Mike Melgares, 13:29.

Men, 30-39: Jim Gilbert, 10:36; Louis Schiavo, 10:55; Bill Lenoir, 11:34; J. W. Moore, 11:53.

Men, 40-49: Claud Edmiston, 10:34; Rele Evans, 12:03; Olav Smistad, 12:12; Paul Chaput, 12:47.

Men, 50 and over: Warren North, 14:30; Rex Martin, 14:42; Tony Giralda, 17:02.

Women, 29 and under: Sue Dragich, 13:16 (only competitor).

Women, 30 and over: Billie Gibson, 18:37; Jan Burns, 24:22 (only competitors).

## Film series continues

The last two films in a series dealing with the organizational communications process will be shown Nov. 9 and 11, from noon to 1 p.m. in the Bldg. 2 auditorium.

The films, from the Berlo Communications Series, are being sponsored by the Employee Development Branch.

Faculty members from the University of Houston and the University of Houston at Clear Lake City

conduct discussion sessions following each movie.

On Tuesday, Nov. 9, the film "Avoiding Communication Breakdowns" will be shown. Dr. Otis Baskin will moderate.

"Changing Attitudes Through Communications" will be shown on Thursday, Nov. 11, with Dr. Walt Natemayer moderating.

For information, contact Eugene Horton, X-3734.



**OLD BOILERPLATES NEVER DIE** — What do you do with an old Apollo test module? Their historic value would make it a shame to melt them down. This one made a short trip from JSC to the nearby Harris County Youth Village where it now is proudly displayed for residents of and visitors to the facility.

## EAA ATTRACTIONS

### TICKETS

The following tickets are available at the Bldg. 11 Exchange Store from 10 a.m.-2 p.m., Monday-Friday:

**Astroworld** — Tickets good through the end of the season, Nov. 28, may be purchased at \$1.50 off the regular price. Adult tickets cost \$6 from EAA; children's \$5. Children under 3 are free. Get your tickets now to assure yourself of a discount.

**Houston Aeros** — EAA discount gift coupons may be exchanged at the Summit box office for "live" tickets on the night of the game. A \$6.50 coupon gets you an \$8 ticket, \$5.50 gets a \$7.50 ticket and \$4 gets a \$5 ticket. Aeros play Phoenix, Nov. 5; Indianapolis, Nov. 9; San Diego, Nov. 12; Calgary, Nov. 16; Edmonton, Nov. 23 and Dec. 3., and Winnipeg, Nov. 26.

**Six Flags Funseekers Club** — Free membership cards. Six Flags will be open weekends through November.

**ABC Interstate Theaters** — \$1.50 admission tickets.

**Dean Goss Dinner Theater** — Comedy production, *Take My Wife*, \$16/couple. Tickets available every night except Monday, Saturday, through November.

**Disney Magic Kingdom Club** — Free membership cards.

**Sea-Arama Marineworld** — No tickets will be available until December.

### PICNIC TICKET REFUNDS

Picnic refunds will be made through Nov. 12 from 11 a.m. to 1 p.m. in the Bldg. 11 cafeteria. Tickets must be presented for a refund — tales of woe are non-negotiable.

### DEAN GOSS NASA NITE

You asked for it — a NASA Night at the Dean Goss Dinner Theater will be held Sunday, Nov. 14, featuring the comedy production, *Take My Wife*.

Tickets (400 are available) are being sold on a first come first serve basis at the Bldg. 11 Exchange Store for \$7 per person.

Doors open at 6 p.m. Dinner is from 7-8 p.m. Play begins at 8:30 p.m. Highballs are two-for-one, other drinks are regular price.

Make plans now to join us Nov. 14 for a really super night out on the town.

### SUPER TEAMS

Don't forget that teams must register before Nov. 12 to participate in the 1976 Super Teams Competition. Events will start the week of Nov. 15. Call X-3594 for information.

### CHRISTMAS DANCES

Twice the fun is in store this year since we are planning two Christmas dances due to the number of people wanting to attend. The same two bands will play at both dances, only difference is the meal and the price.

First dance is Friday, Dec. 3. For \$10/person you get roast beef dinner and beverages. Second dance on Saturday, Dec. 4, includes prime rib dinner and beverages for \$15/person. Music will be provided by the Dialogue and the Jerry Vann Orchestra.

Tickets go on sale Nov. 9 in the Bldg. 11 Exchange Store from 8 a.m. to 2 p.m. For additional information, call Glenda Lancon, X-2471.

## Don't Forget!



- TO FILE THAT COST REDUCTION REPORT
- SEND YOUR COST REDUCTION CONTRIBUTIONS TO BH 23
- BE SURE TO USE NASA FORM 1105A

# Roundup Swap Shop

Swap Shop advertising is open to JSC federal and on-site contractor employees. Goods or services must be offered as advertised, without regard to race, religion, sex or national origin. Non-commercial personal ads should be 20 words or less, and include home telephone number. Typed or scribbled ad copy must be received by AP3/Roundup by Thursday of the week prior to publication.

### CARS & TRUCKS

73 GMC Crew Cab 3/4-ton pickup. Auto, air, pwr, cruise cont, AM/FM stereo, extra tank. 337-1416.

70 Dodge Coronet Custom. 318-V8, 4 dr, air, pwr. \$950. Germany, 643-4456 after 6.

72 AMC Matador. 2 dr, vinyl top, auto, air, pwr. 360 cu in. 721-1528.

74 Ford F100 Custom Pickup. 6 cyl, xint cond, 51K mi. Sauers, X-3251 or 744-9692 after 6.

70 Ford Sta Wgn, LTD. Air, pwr, very good cond. \$1,025. Redding, X-2478 or 332-1092.

74 Pontiac Firebird. Xint cond, loaded. \$3,500. Sheptock, X-3281 or 938-7019 after 5.

71 Ford LTD. 4-dr. 429-V8, air, power. Runs good, needs hood and body work. \$250. Jim, X-4339 or 481-3648.

73 Gremlin. 6-cyl, air, radio, 44K mi, good cond, must sell, \$1,695. Jim, X-4339 or 644-4436.

72 Thunderbird. Loaded, mech perfect, 1 owner. \$2,200. Kelly, 482-3034 after 5.

74 Chevy Van 3/4 ton, auto, air, customized. Bill, 723-5807 or Mary, X-2789.

73 Chevy Van conversion self-contained mini-motorhome. Loaded, 22K mi, xint, blue/white. \$4,500. Phillips, 643-4002.

75 Datsun B210 Hatchback. 4-spd, air, AM/FM stereo, luxury and economy, 40 mpg. \$2,800. Swan, X-3976 or 445-1717 after 2.

70 Merc Cyclone. Good cond, AM, auto, pwr, 429, tudor, bkt seats, green. \$795 or offer. Ward, X-4651 or 946-7860.

76 Ford Pickup. Xint cond. 11K mi. \$5,000. Hector, 477-6624 after 5.

67 VW. Recent overhaul, radial tires. Demoss, X-5927 or 488-4019 after 5.

### BOATS

Bass boat, 75 Invader. 50 HP Mercury; McLean trlr, Big wheel; 2 capt chairs w/cntr console; 3 spd troll motor. Make offer. 681-8934 or 944-2131.

Dismantled 1968 100 HP Johnson outboard. All parts, pwr head assembled, controls, xtra prop, overhaul manual. \$75. 333-2808.

### PETS

AKC reg Beagles. Champ sired. 333-2436.

Hamster Habitrail. 4 rms, wheel, xtras. Great Xmas gift for kids. 488-3433.

Stud service. AKC reg silver/white toy poodle, 8 in high, 5 lbs. \$50 cash. 333-3227 after 3 & wkends.

### STEREO EQUIPMENT

Zenith solid state AM/FM stereo w/turntable, speakers & tapedeck. Used 2 wks. \$250. Ford, X-2271.

Two EPI-50 speakers. \$50 ea. Lake, X-3286 or 523-2137.

### CYCLES

Two All-Pro 20-in girls' bikes. \$8 ea. 946-4311.

Two girls' 10-spd bikes. Like new, ridden little. \$45 ea. Jay, X-6357 or 481-2335.

75 Suzuki RV-90. Blue, 279 mi, like new. \$475. Wilson, 944-1524 after 5.

### WANTED

GM car seat for 1-yr-old baby. 334-4175.

One horse covered trailer ball hitch. Must be good cond, brake lites, etc. Rustbuckets please don't call. 488-2801.

Tent, 3-4 man lightweight. Prefer rip-stop nylon. 944-6450 after 5.

### MISCELLANEOUS

1959 Les Paul Model Gibson Guitar. Xint buy. \$500. Taylor, 477-3964 after 5:30.

Two tickets to the Texas/A&M football game, Nov. 25. Joan, X-5331 or 488-3136 after 5.

US plate blocks. All different, only 50% above face. \$15/packet. Jeff, X-6356 or 482-5393 after 5.

8-ft wide patio door ensemble, complete. \$80. Reim, 944-3795.

Edmund 6X30 binoculars w/case. \$20. Lake, X-3286 or 523-2137.

Six quart elec freezer. Never used, \$20. Large Afghan, \$25. 946-4311.

Camper top. Center vertical rear door. Insulated, fits LWB pickup. \$115. Hull, X-6291 or 334-3134.

Everlast medium weight punching bag. Approx 18-in dia X 3-ft long. Ideal for workouts, karate practice. Like new, chain, swivel incl. \$25. Muhly, 471-3762.

7X7 umbrella tent. Cost \$50, sell \$30. Muhly, 471-3762.

Rent/sale CLC Middlebrook, 4-2-2, contemp w/atriums and skylight, fireplace; fenced, near schs, 1 yr old, 2240 sq ft. \$485/mo. or \$61,900. 474-2081 or 488-0346.

### LATE ENTRIES

Wanted: Desperately need ride from area of Sears, Pasadena, to Bldg. 416. Hours open. Gloria Alvarado, X-4036 or 472-5985.

Wanted: Ride from 145 at Cullen, 8-4:30. Will pay. Liana, X-2386 or 921-4270.

## Varied interests, adventures color life of Italian engineer

Whether he's sailing across the Norwegian Sea in a rubber raft, mountain climbing in his native Italy or soaring on the thermals above Houston, Francesco Costanzo is in his element.

For Costanzo, spaceflight may be the ultimate adventure. He is a 34-year-old engineer with the European Space Agency (ESA) and has been working at JSC on a grant since October, 1975.

Costanzo, who prefers to be called by his nickname, Ciccio, leaps down stairs, four or five at a bound. He runs when others walk. He directs as much of that energy into his work as into his hobbies, which have also included skydiving, SCUBA diving and playing the recorder.

"Ciccio really hustles. He makes things happen," observed Dale Nussman, a co-worker in the Displays and Controls Section, Crew Station Design Branch.

Costanzo has been working here in the field of man-machine engineering, particularly on hand controllers. He holds degrees from the University of Genoa in mechanical

engineering and naval architecture and worked for ESA for six years in the Netherlands. He returns to Holland in December.

While at JSC, he has authored papers on the Orbiter's Remote Manipulator System hand controllers and assisted in defining their size and location. He has also defined procedures on calibration of the controllers and written a technical note on the state of the art of such devices.

Costanzo has served as a test subject in the Bldg. 260 water tank (used to simulate weightlessness) for evaluation of the suction cup shoes and the Orbiter aft crew station restraint system. He has flown in the KC135 Zero Gravity Aircraft.

The engineer has also expanded his professional knowledge by attending a manual control conference in Illinois, and technical briefings in Alabama and California. In his "extra time" he has taken courses at the University of Michigan, Rice, and the University of Houston.

Recently, Costanzo began work-

ing with Structures and Mechanics division employees analyzing the coupling of mathematical models of ESA's Spacelab with mathematical Shuttle models.

Object is to make certain Spacelab can stand the stresses when it is launched into orbit aboard Shuttle as an international cooperative space venture of the 1980's.

"We should be able to demonstrate that Spacelab can stand the loads," Costanzo said. "They are flexible structures, both Spacelab and Shuttle."

Costanzo has applied with ESA to be a payload specialist for Spacelab. With his adventurous spirit, it seems logical he wants to be an astronaut.

The Italian explained his feelings as he described the raft trip from Iceland to Norway which he and five friends took in August, 1975, and another they are planning next year from Singapore to Darwin, Australia.

"Those are the things you remember," he said. "Not hand controllers."



CHECKING THE SHOES — Italian engineer Francesco Costanzo examines the suction cup shoes which he has helped evaluate in underwater tests. Costanzo, an employee of the European Space Agency working at JSC on a grant, has also done extensive work in the field of hand manipulators such as are used in the Orbiter's Remote Manipulator System.

## Unique transporter moves Shuttle tank

A unique vehicle called the Straddle Carrier Transporter is used to move sections of the Space Shuttle's gigantic External Tank (ET) at NASA's Michoud Assembly Facility (MAF) in New Orleans.

The huge, self-propelled vehicle has an integral hoisting system capable of lifting, stabilizing and transporting major ET assemblies over concrete floors and improved roadways.

The assembled ET will be about 8.5 meters (27 feet) in diameter and 47.2 meters (155 feet) long. It will weigh some 33,300 kilograms (73,415 pounds) empty and will carry about 708,440 kilograms (1,561,816 pounds) of propellants for launch.

The major tank assemblies to be moved by the device are the liquid oxygen tank, a section 16.5 meters (54 feet) long with a volume of 552 cubic meters (19,495 cubic feet), and the liquid hydrogen tank, 29.3 meters (96 feet) long with a volume

of 1,573 cubic meters (55,552 cubic feet).

A propane-powered engine generator set provides electrical power for all systems while the vehicle is moving. The carrier also has provisions for plugging into commercial power outlets when parked.

The electrical distribution system takes power from the generator or outlet and routes it by cables to the hydraulic propulsion system, steering system, hoist systems and lights.

The hydraulic propulsion system consists of two drive-wheel assemblies, two idler wheel assemblies, two hydraulic power units and a driver's cab with controls.

The hoist system has five electrically powered cable hoists: two 10-ton units on a monorail on the aft frame; two 5-ton devices on a monorail on the forward frame; and a 2-ton hoist on a monorail along the longitudinal centerline of the transporter.



ANIMATED ASTRONAUTS — Well-known Disney characters Mickey Mouse and Pluto recently excited young visitors to Bldg. 2 when the "animals" took their own tour of the center. Here they are shown checking out the lunar rover. The characters are in the Houston area on a promotional tour and have been appearing at various shopping centers.

## Two employees receive AAS's Prather award

Two JSC employees have won the American Astronautical Society's Victor A. Prather Award for achievement in the field of extravehicular protection in space.

David C. Schultz, Mission Operations Branch chief, Flight Control Division, and Harold J. McMann, Portable Life Support Systems Section head, Crew Systems Division, were presented the awards last month at a banquet in Washington, D.C.

The society also gave awards to Skylab 4 crewmembers. Gerald Carr and William Pogue were present for the ceremonies.

# Ice sensing system aids Arctic ships

The guiding of cargo ships safely through treacherous ice-laden waters of the Arctic Ocean is just another example of space technology being used to help solve problems on Earth.

A successful three-week demonstration of an all-weather ice information system was recently completed along the western and northern coasts of Alaska in a joint program involving the U.S. Coast Guard, National Weather Service, NASA and the U.S. Navy.

The North Slope region was selected for this demonstration because it experiences serious shipping problems 60 percent of the time due to thick ice.

In many cases, barges have been weathered in at ports or have had to turn back from their destinations with their cargoes having to be shipped by other, more expensive means. In the summer of 1975, many barges were trapped in the

Arctic ice while others fled south to ice-free waters. The additional expense of transporting this equipment was estimated at between \$30 and \$50 million in direct cost for 1975 alone.

A test demonstration of NASA's remote sensing ice information system was scheduled to determine whether it would be able to alleviate this problem.

A Coast Guard C-130B plane equipped with NASA's side-looking airborne radar system (SLAR) flew over the Arctic sea lanes obtaining daily ice data. The system provides microwave imagery similar to black and white photographs. Unlike photography, however, SLAR is able to determine the type and distribution of ice, even through dense cloud cover and in just about any kind of weather.

As the plane flew over the Arctic, the SLAR system and other appropriate electronic equipment

were able to collect and transmit in-flight imagery of coastal shipping lanes approximately 70 miles wide.

These data were relayed to a geosynchronous satellite, to a receiver located at Wallops Island, Va., and on to the NASA's Lewis Research Center in Cleveland, Ohio, where the images appeared in real time. After rapid processing, the images were re-transmitted from Cleveland via the joint U.S.-Canadian Communications Technology Satellite to Barrow, Alaska, where Navy ice interpreters assisted in providing interpretive navigation charts. The charts were then used as an aid in scheduling and directing vessel movement through and around offshore ice.

The data were also transmitted to the NOAA National Weather Service/Fleet Weather Facility in Suitland, Md., where an ice forecast was prepared.

After shipping season ended,

the system was used farther north in the Arctic to assist the Coast Guard's ice breaker *U.S.C.G.C. Glacier*. With the aid of SLAR, the *Glacier* was able to operate through ice in conditions where there was no visibility.

In both demonstrations, the SLAR system was considered to be a complete success.

The ice information system came about as a result of a request from Congress to see whether the Great Lakes could be kept open all year. Virtually all Great Lakes shipping formerly ceased from December 15 through April.

In 1972, Congress named 12 federal agencies, including Lewis Research Center, to the Winter Navigation Board. The Board was responsible for finding out how season extension would affect the environment and economy; how much it would cost, and how much it would

benefit commerce by being able to keep the lakes open all year.

Many technical problems had to be handled. For ice information, problems such as identifying what the microwave system actually sees, recognizing the different types of ice, and determining the fastest method of relaying the information to the vessel masters had to be dealt with.

Since the SLAR system was put into use over the Great Lakes it has aided in keeping the shipping season open for two full seasons, for the first time, at an estimated eventual gain of hundreds of millions of dollars per year.

The shipping season of 1976-77 is the third and final demonstration year of the SLAR system. NASA plans to deploy a similar microwave imaging system on the Seasat A satellite which is presently scheduled for launch in 1978.